PATENT
Docket No. 146712000400

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In the application of:

Qixu (David) CHEN et al.

Serial No.: 09/559,347

Filing Date: April 27, 2000

For: MEDIUM WITH NiNb SEALING LAYER

Examiner: Kevin M. Bernatz

Group Art Unit: 1773

REPLY BRIEF

Commissioner for Patents
Washington, D.C. 20231

Sir:

In response to the Examiner's Answer of February 26, 2003, Appellants submit the following Remarks.

REMARKS

A. The Examiner's Arguments that Appellants are NOT Required to Compare the Claimed Invention Against a Hypothetical Piece of Prior Art are Unrepresentative.

On page 15, lines 16-20, of the Examiner's Answer, the Examiner states:

> In the present case, the "hypothetical piece of prior art" possesses a laser textured NiNb layer, which appellants claimed invention does not. It is the effect of laser texturing on the NiNb layer which is the entire basis for the question on whether the Li ion migration would necessarily be present in the "hypothetical piece of prior art."

What the Examiner fails to explicitly clarify is the following. First, Ross (U.S. Pat. No. 5,980,997) discloses a laser textured NiNb layer, but it does *not* disclose Li ion containing substrate. Second, at least 25 Li-ion containing substrates are disclosed in Taguchi (U.S. Pat. 5,874,374), which does *not* disclose a NiNb layer. Third, there is *no* embodiment in either Ross or Taguchi disclosing ***both*** a Li-containing substrate and a NiNb layer deposited on the substrate. Fourth, neither Ross nor Taguchi disclose an amorphous NiNb-containing sealing layer directly on a glass or glass-ceramic substrate, wherein the sealing layer has a thickness of about 450Å or less and substantially prevents migration of Li from the substrate to the magnetic layer of the magnetic recording medium.

The inquiry for the determination of a *prima facie* case of obviousness should be whether the cited references would have taught or suggested the claimed invention *as a whole*, including the NiNb sealing layer that has the claimed properties. The Examiner has failed to establish a *prima facie* case of obviousness because Ross and Taguchi do not teach or suggest the claimed invention *as a whole*. The Examiner has instead focused on "inherent" Li migration through

"laser textured NiNb layer." A laser textured NiNb layer has no relevance to the claimed invention in which the NiNb layer is not laser textured.

With regard to inherency and rejection under 35 USC 103, MPEP 2141.02 states:

> DISCLOSED INHERENT PROPERTIES ARE PART OF "AS A WHOLE" INQUIRY
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> "In determining whether the invention as a whole would have been obvious under 35 U.S.C. 103, we must first delineate the invention as a whole. In delineating the invention as a whole, we look not only to the subject matter which is literally recited in the claim in question ... but also to those properties of the subject matter which are inherent in the subject matter *and* are disclosed in the specification. ... Just as we look to a chemical and its properties when we examine the obviousness of a composition of matter claim, it is this invention *as a whole,* and not some part of it, which must be obvious under 35 U.S.C. 103." *In re Antonie*, 559 F.2d 618, 620, 195 USPQ 6,8 (CCPA 1977) (emphasis in original) (citations omitted) ... .
>
> Obviousness cannot be predicated on what is not known at the time an invention is made, even if the inherency of a certain feature is later established. *In re Rijckaert*, 9 F.2d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993).

Applicants respectfully submit that the Examiner has focused on "inherency" while ignoring the requirement that the "DISCLOSED INHERENT PROPERTIES ARE PART OF 'AS A WHOLE' INQUIRY."

Furthermore, in order to compare the claimed invention against "prior art products," (see Examiner's Answer, page 8, line 1) a person of ordinary skill has to undertake the following steps. First, select a glass substrate from **25** examples of Li-containing glass substrates. [See Tables 1-6 of Taguchi.] Second, select a thickness of the NiNb layer from "a thickness between 10 and 1000 nm." [See Ross, col. 8, 17-18.] Third, deposit a certain thickness of NiNb *directly* on a Li-containing substrate of Taguchi based on the following one line disclosure from Ross:

"In another embodiment, NiNb is sputtered directly onto substrate 112." [Col. 8, lines 1-2.] Other than this one-line disclosure, there is *no* additional disclosure in Ross relating to NiNb deposited directly on the substrate. For example, Ross does not teach how to deposit NiNb directly on a glass substrate or what should be the physical properties of the NiNb film layer deposited directly on a glass substrate. In fact, Professor Ross of MIT, the inventor on the Ross patent, states: "There is no reason to believe that a material that works well for laser texture should work well as a sealing layer, since these two applications rely on different physical properties of the thin film materials." [Ross Declaration of August 21, 2002, page 3, lines 9-11.] In short, one would have to deposit NiNb directly on a Li-containing glass substrate of Taguchi without any teaching from Ross as of how to deposit the NiNb layer directly on a Li-containing glass substrate or what structure (amorphous, crystalline, semi-crystalline) of NiNb to obtain. Fourth, select laser texturing parameters of a "vanadate laser[] [having] a laser pulse duration of 14 to 260 ns, an energy per pulse of 0.1 to 10 microjoules, and a spot size of 6 to 11 microns." [See Ross, col. 7, lines 26-28.]

If the selection of the values of all these variables from Taguchi and Ross is not based on hindsight gained from Appellants' invention, then what is the basis for the selection of the values of these variables for a comparison with the Appellants' claimed invention? Clearly, there is *no* basis whatsoever disclosed in the cited prior art. Besides, the Examiner has *failed* to explicitly state as to what should be the product that should be compared against the Appellants' claimed invention. Thus, a product assembled based on the teachings of Taguchi and Ross for a comparison with Appellants' claimed invention would be nothing more than a *hypothetical* product created by arbitrary selection of the values of the constituents and laser texturing parameters for making the product. In short, the Examiner has totally failed to identify what

products should be compared against the claimed invention and yet insists that Appellants must provide "***evidence*** showing that the prior art products do not necessarily process [sic, possess] the characteristics of the claimed product." [See Examiner's Answer, page 8, lines 1-2.]

The Federal Circuit has stated that "when the reference is silent about the asserted inherent characteristic, such gap in the reference may be filled with recourse to extrinsic evidence. Such evidence must make clear that the missing descriptive matter is *necessarily present* in the thing described in the reference, and that it would be so *recognized* by persons of ordinary skill." *Continental Can Co. USA v. Monsanto Co.,* 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991) (emphasis added). Ross is silent about a "sealing layer [comprising substantially amorphous NiNb] ha[ving] a thickness of about 450Å or less ...[that] substantially prevents migration of Li from the substrate to the magnetic layer of the magnetic recording medium" as recited in claim 21, for example. Besides, Ross lacks "evidence [that] *must* make clear that the missing descriptive matter is *necessarily present* in the thing described in the reference." *Id.* In column 8, lines 51-67, Ross states:

> A substrate was prepared by depositing 20 nm thick Cr as a borosilicate glass substrate. Amorphous NiNb layers having thicknesses of 100 nm, 500 nm and 1 micron were sputtered on the Cr layer and laser textured. The NiNb was 50% Ni by mole. Laser pulses of 0.5 to 13 microjoules, 25 to 264 ns in duration, and spot sizes of 6 to 11 microns were used. Sombrero shaped bumps were formed under all conditions, but size and height increased with power. By reducing film thickness, one could use less power to make bumps of a given size. If laser power was too great, the laser would burn through the NiNb film. The thinner the film, the less energy was needed to burn through the NiNb. Also, the smaller the spot size, the less energy was needed to burn through the NiNb. However, this is not a problem, because *texture bumps having heights between 0 and 100 nm can be formed using laser power that was not so great as to burn through the NiNb.* [Emphasis added.]

Even by reading this quoted disclosure of Ross, in particular the emphasized portion, "it would [*not*] be so *recognized* by persons of ordinary skill" [*Continental Can,* 948 F.2d at 1268; emphasis added] that a sealing layer comprising substantially amorphous NiNb having a thickness of about 450Å or less will *necessarily* substantially prevents migration of Li from the substrate to the magnetic layer of the magnetic recording medium such that the Li concentration on the surface of the magnetic media to less than 500 counts/minute by the time-of-flight secondary ion mass spectroscopy (TOF-SIMS).

In fact, Professor Ross, who in the inventor on the Ross reference and a person of ordinary skill in this art states the following on page 6, lines 3-11 of the Ross Declaration of August 21, 2002:

> In particular, it is not necessary that a NiNb film of 450Å (45 nm) or less, or indeed of any material in this thickness range, subjected to laser texturing, would prevent diffusion of Li, due to the unknown relationship between diffusion-barrier properties and bump formation in materials, and the unpredictable effects of laser texturing on the diffusion-barrier properties of thin films. Thus the diffusion-barrier property of NiNb layer would not have been recognized by a person of ordinary skill who would have combined the teachings of Ross and Taguchi and thereby sputtered NiNb directly onto a Li-containing substrate. Without even recognizing that a NiNb layer sputtered directly on a Li-containing substrate could prevent Li migration, I fail to understand how a person of ordinary skill could have arrived at this invention by combining the teachings of Ross and Taguchi.

The above statements of Professor Ross are the concluding statements in the Ross Declaration based on factual evidence presented throughout the Ross Declaration. The Examiner has not argued that Dr. Ross is not a person of ordinary skill in this art. Instead, the Examiner argued in the Advisory Action of September 27, 2002, page 2, lines 17-18, that "the declaration provided by Dr. Ross is not convincing that the [laser-textured] NiNb layer would not inherently prevent

[Li] ion migration because Dr. Ross admits that the effects are unknown ... ." [Emphasis added.] Dr. Ross states that the effects of NiNb on Li ion migration from a Li-containing substrate to a magnetic layer are unknown because there is no prior art that discloses a NiNb layer directly on a Li-containing glass substrate. Thus Dr. Ross has stated a fact.

On the other hand, the Examiner argues that Dr. Ross has not shown that "the [laser-textured] NiNb layer would not inherently prevent [Li] ion migration." Foremost, *nobody* can show "the [laser-textured] NiNb layer would not inherently prevent [Li] ion migration" *based on the prior art* (other than by creating a hypothetical embodiment) because there is *no* prior art embodiment disclosing a NiNb layer directly on a Li-containing glass substrate. The court in *Elan Pharmaceutical, Inc. v. Mayo Foundation For Medical Education Research*, 304 F.3d 1221, 64 USPQ2d 1292 (Fed. Cir. 2002), has clarified that "*new products are not "anticipated" when they did not previously exist*, whether or not the process for making them is generally known. ... A precatory suggestion of general procedures that may or may not succeed in producing the novel product, a product that has not previously been produced, does not convert the suggested product into a previously existing product." [Emphasis added.] In the present case, the bottom line is similar to that in *Elan Pharmaceutical*, which is that the claimed product *did not previously exist* and therefore the claimed property of the NiNb layer directly deposited on a Li-containing glass is not "inherent" in any prior art product. What the Examiner is attempting to do is establish "inherency" based on Appellants' *own* invention. However, "[o]bviousness cannot be predicated on what is not known at the time of an invention is made, even if the inherency of a certain feature is later established." *In re Rijckaert*, 9 F.2d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993).

In the pending case on appeal, the Examiner is assuming that the sealing layer or the sealing means having a thickness of about 450Å or less and substantially preventing migration of Li from the substrate to the magnetic layer of the magnetic recording medium is somehow "inherent" in a magnetic medium arrived by combining Ross and Taguchi. The Board in *Rijckaert* did the same and the Federal Circuit reversed:

> The Board concluded that the subject matter of the claims would have been obvious over Awamoto in view of Driessen, stating that "the time expansion or time compression relationship is satisfied for the expansion of two disclosed [in] Awamoto when a wrapping angle of 360 degrees, one pair of heads and no non-recording intervals are assumed." The Board further asserted that the recognition of the claimed relationship between time expansion/compression and the three variables a, n, and M is "the mere discovery of a relationship that is applicable to [a] prior art apparatus[, and] does not [give] rise to a patentable invention." Thus, in affirming the rejection, the Board first assumed that the claim limitation at issue, the relationship between time expansion/compression and the three variables, was somehow "inherent" in the prior art as shown by Awamoto. The Board also assumed specific values for the claimed variables in order to assert that Awamoto's device satisfies the claimed relationship.
>
> Rijckaert argues that the examiner has not established a prima facie case of obviousness and that the examiner's assumptions do not constitute the disclosure of prior art. We agree. Awamoto does not disclose the wrapping angle of the record carrier around the head drum or the number of times that a head pair which comes in contact with the record carrier does not record a signal on the record carrier. Nor does Awamoto discuss the claimed relationship of the three variables to time expansion/compression. Driessen, the secondary reference, is relied upon only to teach the provision of a pair of write heads having a mechanically rigid coupling to each other and does not remedy the deficiencies of Awamoto. Thus, the prior art relied upon does not disclose, suggest, or render obvious the claimed invention, either individually or when combined.

Awamoto does not describe the use of time expansion and compression as a means of optimally filling tracks, much less suggest that the three variables of the claims are even a factor in determining the amount of time expansion or time compression. Rather, Awamoto is concerned primarily with processing a high-quality broadcast television signal for use in conventional video machinery, and with compensating for errors introduced to such a signal by a transfer circuit. The Commissioner's assertion "that the [analysis discussed in his brief] and Awamoto demonstrate that the relationship was, in fact, well known in the art" is unavailing. While the court appreciates the Commissioner's thorough explanation of the claimed relationship in his brief, the Commissioner's brief is not prior art. The prior art is Awamoto, and it does not indicate that the relationship is well known in the art, nor does it suggest the claimed relationship. See In re Yates, 663 F.2d 1054, 211 USPQ 1149, 1151 (CCPA 1981) (when the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in the reference).

To support the Board's affirmance of the rejection, the Commissioner points out that in the recording art, the exact matching of signal time to recording time is an optimal [*1534] condition, and that this condition would be met by fulfilling the claimed relationship. While the condition described may be an optimal one, it is not "inherent" in Awamoto. Nor are the means to achieve this optimal condition disclosed by Awamoto, explicitly or implicitly. "The mere fact that a certain thing may result from a given set of circumstances is not sufficient [to establish inherency.]" In re Oelrich, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981) (citations omitted) (emphasis added). "That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown." In re Spormann, 53 C.C.P.A. 1375, 363 F.2d 444, 448, 150 USPQ 449, 452 (CCPA 1966). Such a retrospective view of inherency is not a substitute for some teaching or suggestion supporting an obviousness rejection. See In re Newell, 891 F.2d 899, 901, 13 USPQ2d 1248, 1250 (Fed. Cir. 1989).

Rijckaert at 1533-34.

Appellants respectfully submit that the Examiner is taking a retrospective view of inherency. "[A] retrospective view of inherency is not a substitute for some teaching or suggestion which supports the selection and use of the various elements in the particular claimed combination." *In re Newell*, 891 F.2d 899, 12 USPQ2d 1248 (Fed. Cir. 1989), cert. denied, 493 U.S. 814 (1989). *In Newell*, the Federal Circuit reversed an obviousness rejection of a particular claimed combination when the prior art did not disclose or suggest the function of the claimed function even though the prior art did disclose the various elements of the claimed combination.

> The Board held that Newell had simply combined various elements of known tape drives, and that it would have been obvious to do so because it was "a mere substitution of one conventional tape capstan drive for another". Newell argues, however, that the elements of the prior art are not simply physically combined and that his indirect power transfer from the power belt through the capstan to the drive belt is not shown or fairly suggested in the prior art.
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> Newell correctly states that the roller in the Weiss reference does not have a power transfer function. Newell also states, and the Solicitor does not dispute, that his new drive system achieves significantly enhanced power transmission to the tape, as compared with the prior art. Although the Solicitor argues that it is inherent that a belt drive will provide greater surface contact with the cartridge capstan, and thus better power transfer, a retrospective view of inherency is not a substitute for some teaching or suggestion which supports the selection and use of the various elements in the particular claimed combination.

Newell at 901.

In the pending case on appeal, the Examiner making the same mistake as that made by the Solicitor in *Newell*. In particular, the Examiner in the pending case on appeal is arguing that the Appellants have simply combined various elements from prior art and therefore the claimed

sealing layer function is somehow "inherent" in a magnetic medium arrived by combining elements of the prior art.

B. The Examiner's Arguments for Interpreting the Meaning of "Sealing Means" are Without Merit.

In the paragraph bridging pages 15 and 16, the Examiner states that he can interpret the meaning of "sealing means" without considering the definition of "sealing means" in the specification on page 11, lines 5-8, because the definition of "sealing means" uses the term "can," not "must." In particular, page 11, lines 5-8, define the "sealing layer or a sealing means" as:

> A sealing layer or a sealing means is a layer that can reduce Li concentration on the surface of the magnetic media to less than 500 counts/minute by the time-of-flight secondary ion mass spectroscopy (TOF-SIMS).

The *Merriam-Webster's Collegiate Dictionary*, 165 (1997) defines "can" as "to be able to do, make, or accomplish." Inserting the definition of "can" in the definition of the "sealing layer," one obtains:

> A sealing layer or a sealing means is a layer that ... *accomplish[es]* reduc[tion of] Li concentration on the surface of the magnetic media to less than 500 counts/minute by the time-of-flight secondary ion mass spectroscopy (TOF-SIMS).

Clearly, the above interpretation of a sealing layer or a sealing means based on the *Merriam-Webster's Collegiate Dictionary* is consistent even with the Examiner's position that the language should be "a layer that reduces Li concentrations." [See Examiner's Answer, page 16, lines 2-3.]

It has been stated by the Federal Circuit that consistent with the well-established axiom in patent law that a patentee is free to be his or her own lexicographer, a patentee may use terms in a manner contrary to or inconsistent with one or more of their ordinary meanings. *Hormone Research Foundation Inc. v. Genetech Inc.*, 904 F.2d 1558, 15 USPQ2d 1039 (Fed. Cir. 1990). Therefore, it is incorrect for the Examiner to ignore the definition of the term "sealing means" when this term is clearly defined in the specification. Appellants therefore request that the term "sealing means" should be interpreted in light of the specification.

CONCLUSIONS

For the foregoing reasons, Appellants submit that the obviousness rejections and the obviousness-type double patenting rejection should be withdrawn.

In the event that the transmittal letter is separated from this document and the Patent and Trademark Office determines that an extension and/or other relief is required, Appellants petition for any required relief including extensions of time and authorize the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952,** referencing docket number 146712000400.

Respectfully submitted,

Dated: April 21, 2003 By: _____

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